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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/045,306	10/23/2001	Chi-Chan Chen	5198-3	1280

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EXAMINER
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PADMANABHAN, KARTIC

ART UNIT	PAPER NUMBER
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1641

DATE MAILED: 10/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/045,306

**Applicant(s)**

CHEN ET AL.

**Examiner**

Kartic Padmanabhan

**Art Unit**

1641

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 01 April 2002.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 April 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 14-15 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s) or amend the claim(s) to place the claim(s) in proper dependent form. Claims 14 and 15 limit the way in which the light is focused, which is a process limitation that does not merit patentable weight in claims drawn to a device.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claim 1 is rejected as vague and indefinite for the recitation of “adapted” because it has been held that the recitation that an element is “adapted to” perform a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. *In re Hutchison*, 69 USPQ 138. The recitation “adapted for” is not clear as to how the device has been modified to perform the biological operations.

5. Claim 16 is rejected as vague and indefinite for the recitation of a “second charged biological species” because there is no recitation of a first charged biological species. In addition, applicant should change “a photovoltaic device of claim 1” to “the photovoltaic device of claim 1.”

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1, 4, 10, 12, and 16-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Edman et al. (US Pat. 6,706,473 B1). The reference discloses systems and devices for photoelectrophoretic transport and hybridization of oligonucleotides in a liquid environment. A chemically stabilized semiconductor photodiode or photoconductor surface is coated with a streptavidin-agarose permeation layer. Microillumination of the surface generates photoelectrochemical currents that are used to electrophoretically transport and attach biotinylated DNA to selected locations. The same process is then used to transport and hybridize labeled DNA target strands to the attached strands, wherein the signal is then detected (Col. 6). The substrate of the device of the reference comprises a first face and second face, a conductor contacting at least a portion of the first face, a permeation layer of agarose on the second face, attachment entities coupled to the permeation layer, and a light source that illuminates the substrate. Further, the conductor contacting the first face of the substrate may be a metal film of copper (Cols. 43-44). The device of the reference may further include a chemical layer supported on the substrate which may be manganese oxide. A metal layer of preferably palladium may be disposed between the chemical layer and substrate. Further, the device may also comprise a containment structure disposed in fixed relation to the substrate, wherein the containment means

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includes a sheet of polytetrafluoroethylene having an aperture there through (Col. 44). The device of the reference may also comprise an optical fiber between the light source and the surface of the device (Col. 44).

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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11. Claims 5-9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Edman et al. (US Pat. 6,706,473) in view of Mowles (US Pat. 6,541,695).

Edman et al. teach a device, as previously discussed. However, the reference does not teach the specific material of the metal or transparent layers.

Mowles teaches a photovoltaic cell comprising a thin film, photovoltaic layer, a transparent electrical conducting layer in contact with the photovoltaic layer, and a back electrical conducting layer on a substrate (abstract). According to the reference, the transparent conducting layer may be made of tin oxide or indium tin oxide (Claim 16). The photovoltaic cell may comprise an antireflection layer made of B<sub>6</sub>P on the front conductor which allows incident light to pass through to the photovoltaic layer. This antireflection layer is especially hard and inert (plate) (Claims 21-22). Furthermore, the metal film of the photovoltaic device may be composed of gold, platinum, palladium, or titanium (Claim 30).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to use gold or platinum as the metal instead of copper or palladium as taught by Mowles with the device of Edman et al. because they all have very similar properties as evidenced by their classification as transition metals, as well as their proximity to one another on the Periodic Table. In addition, Mowles uses palladium as well as platinum or gold in their device. It would have also been obvious to use a transparent plate as taught by Mowles with the device of Edman et al. because Mowles teaches that this antireflection layer is especially useful to transmit light to the photovoltaic layer. Further, one would have had a reasonable expectation of success in including a transparent layer of thin film layer of tin oxide or indium tin oxide as taught by Mowles with the device of Edman et al. because they still allow for the passage of light, and, according to Edman et al., are also very well suited for attachment of various biomolecules.

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12. Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Edman et al. (US Pat. 6,706,473) in view of Sosnowski et al. (US Pat. 6,518,022) and Attridge et al. (US Pat. 5,830,766).

Edman et al. teach a device, as previously discussed. However, the reference does not teach the use of a dielectric material.

Sosnowski et al. teach electrodes. According to their reference, microlocations are often confined with dielectric materials to move, separate, hold, or orient molecules, although dielectric materials are not required in their method. However, the reference does not teach silica as the dielectric material.

Attridge et al. teach an immunoassay, wherein silica is used as a dielectric material.

It would have been *prima facie* obvious to use the dielectric material taught in Sosnowski et al. and Attridge et al. with the device of Edman et al. because dielectric materials are routinely used with microarrays to orient molecules in predetermined ways.

13. Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Edman et al. (US Pat. 6,706,473) in view of Bogdanov (US Pat. 6,245,507).

Edman et al. teach a device as previously discussed. However, the reference does not teach the use of a lens.

Bogdanov teaches the imaging of nucleic acids, wherein a light source with expansion and focusing lenses are used to transmit light to a microarray.

It would have been *prima facie* obvious to substitute the lens of Bogdanov for the optical fiber of Edman et al. with a reasonable expectation of success, as both are used to filter and focus light in a desired way, and depending on the manner in which one wished to transmit light to the array, one would have been able to choose the appropriate component. In addition, it has been

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held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

***Conclusion***

Claims 1-18 are rejected.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kartic Padmanabhan whose telephone number is 571-272-0825. The examiner can normally be reached on M-F (8:30-5:00).


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on 571-272-0823. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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